

RQA0004LXAQS

Silicon N-Channel MOS FET

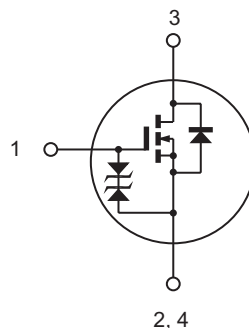
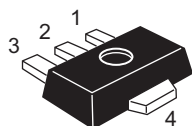
REJ03G1567-0100
Rev.1.00
Jul 04, 2007

Features

- High Output Power, High Gain, High Efficiency
Pout = +29 dBm, Linear Gain = 21 dB, PAE = 68% (f = 520 MHz)
- Compact package capable of surface mounting

Outline

RENESAS Package code: PLZZ0004CA-A
(Package Name : UPAK[®])



1. Gate
2. Source
3. Drain
4. Source

Note: Marking is "LX".

*UPAK is a trademark of Renesas Technology Corp.

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V _{DSS}	16	V
Gate to source voltage	V _{GSS}	±5	V
Drain current	I _D	0.3	A
Channel dissipation	P _{ch} ^{note}	3	W
Channel temperature	T _{ch}	150	°C
Storage temperature	T _{stg}	-50 to +150	°C

Note: Value at Tc = 25°C

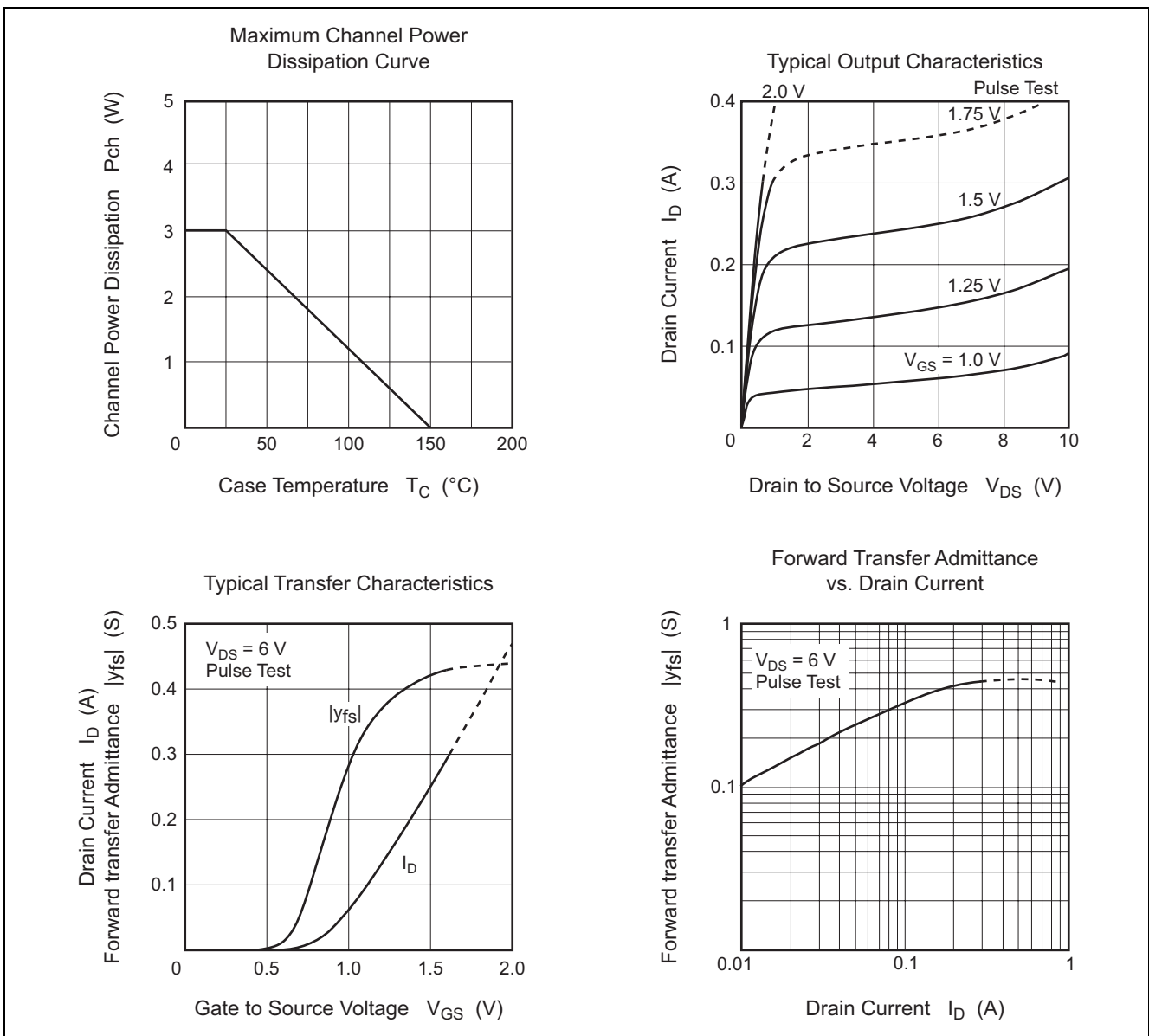
This device is sensitive to electro static discharge. An adequate careful handling procedure is requested.

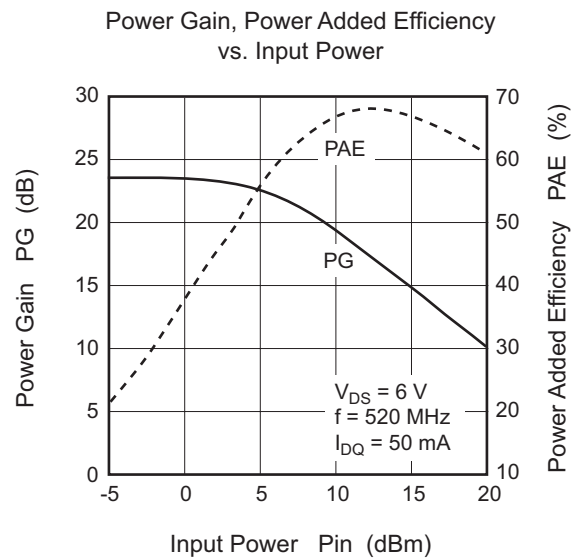
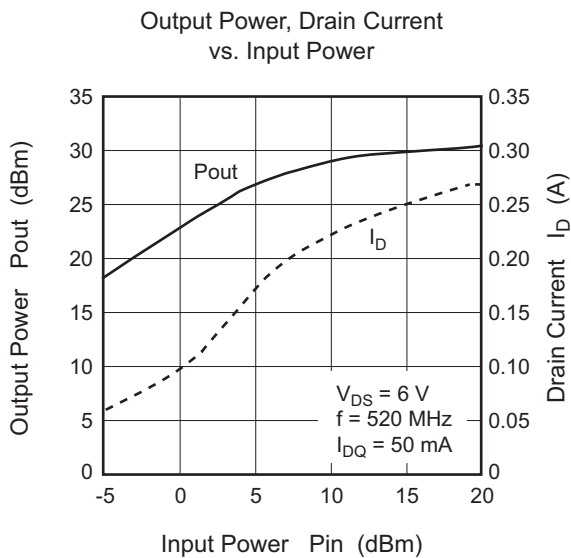
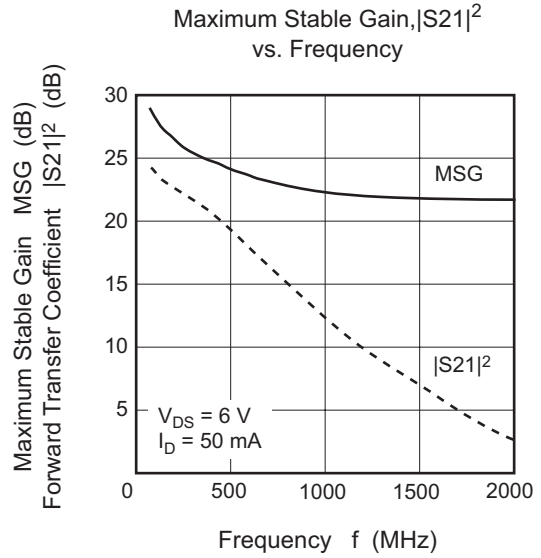
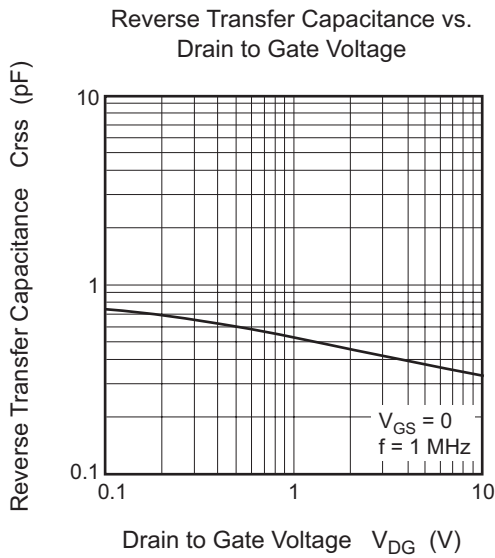
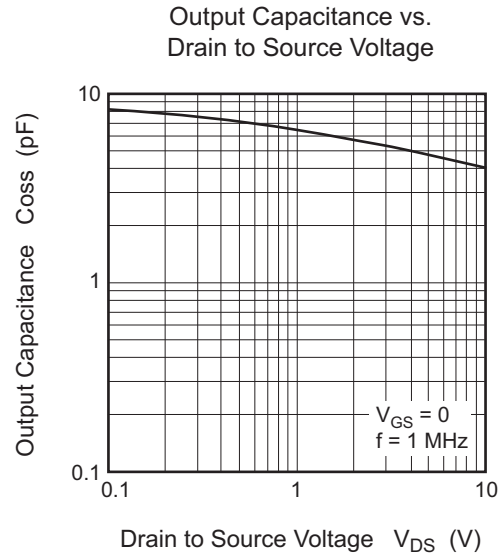
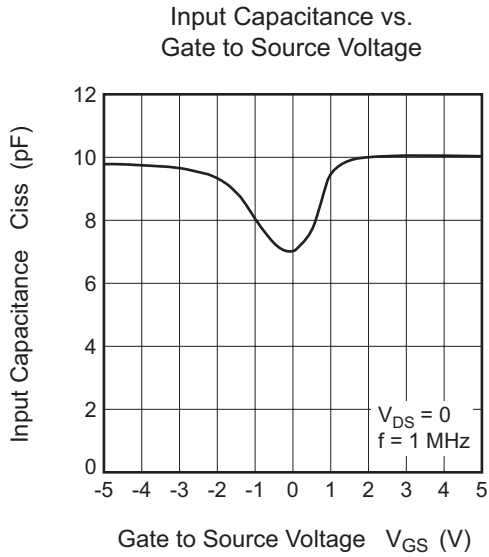
Electrical Characteristics

(Ta = 25°C)

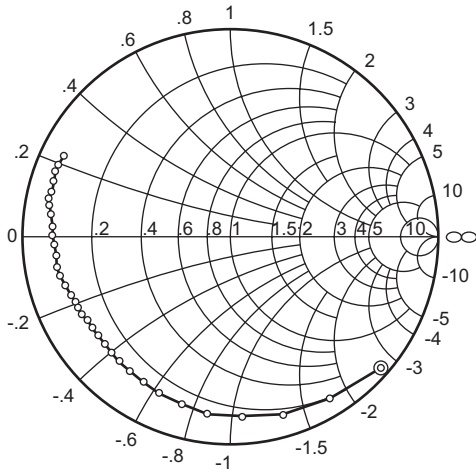
Item	Symbol	Min.	Typ	Max.	Unit	Test Conditions
Zero gate voltage drain current	I_{DSS}	—	—	2	μA	$V_{DS} = 16 V, V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 2	μA	$V_{GS} = \pm 5 V, V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	0.3	0.6	0.9	V	$V_{DS} = 6 V, I_D = 1 mA$
Forward Transfer Admittance	$ y_{fs} $	—	0.43	—	S	$V_{DS} = 6 V, I_D = 0.3 A$
Input capacitance	C_{iss}	—	10	—	pF	$V_{GS} = 5 V, V_{DS} = 0, f = 1 MHz$
Output capacitance	C_{oss}	—	5	—	pF	$V_{DS} = 6 V, V_{GS} = 0, f = 1 MHz$
Reverse transfer capacitance	C_{rss}	—	0.4	—	pF	$V_{DG} = 6 V, V_{GS} = 0, f = 1 MHz$
Output Power	Pout	—	29.7	—	dBm	$V_{DS} = 6 V, I_{DQ} = 50 mA$
		—	0.93	—	W	$f = 520 MHz$
Power Added Efficiency	PAE	—	68	—	%	Pin = +13 dBm (20 mW)

Main Characteristics



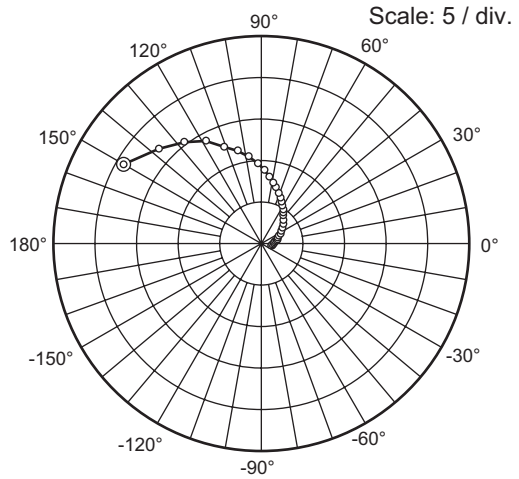


S11 Parameter vs. Frequency



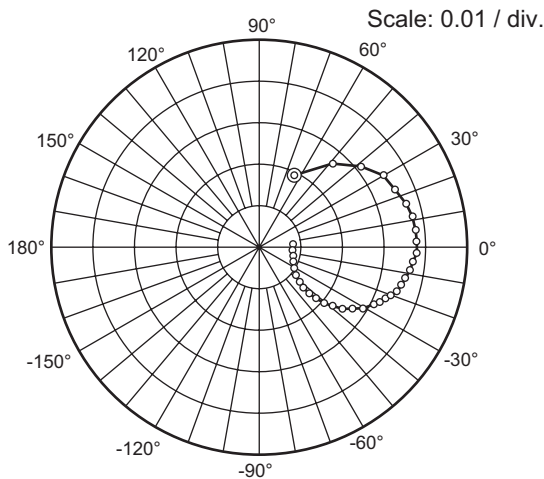
Test condition: $V_{DS} = 6\text{ V}$, $I_{DQ} = 50\text{ mA}$, $Z_O = 50\ \Omega$
 100 to 1000 MHz (50 MHz step)
 1000 to 2500 MHz (100 MHz step)

S21 Parameter vs. Frequency



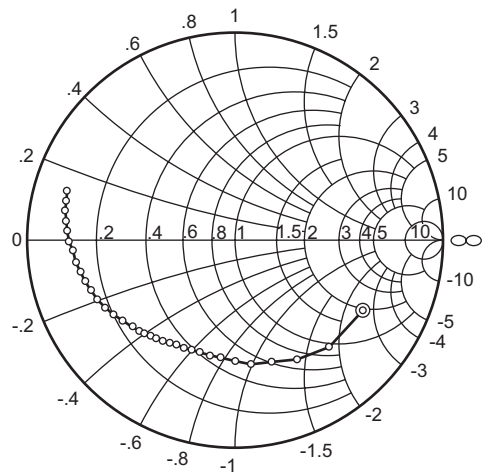
Test condition: $V_{DS} = 6\text{ V}$, $I_{DQ} = 50\text{ mA}$, $Z_O = 50\ \Omega$
 100 to 1000 MHz (50 MHz step)
 1000 to 2500 MHz (100 MHz step)

S12 Parameter vs. Frequency



Test condition: $V_{DS} = 6\text{ V}$, $I_{DQ} = 50\text{ mA}$, $Z_O = 50\ \Omega$
 100 to 1000 MHz (50 MHz step)
 1000 to 2500 MHz (100 MHz step)

S22 Parameter vs. Frequency



Test condition: $V_{DS} = 6\text{ V}$, $I_{DQ} = 50\text{ mA}$, $Z_O = 50\ \Omega$
 100 to 1000 MHz (50 MHz step)
 1000 to 2500 MHz (100 MHz step)

S Parameter

(V_{DS} = 3.6 V, I_{DQ} = 50 mA, Z_o = 50 Ω)

f (MHz)	S11		S21		S12		S22	
	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)
100	0.946	-40.3	15.41	148.7	0.021	69.4	0.784	-30.2
150	0.931	-58.4	12.58	136.4	0.029	46.8	0.744	-51.2
200	0.898	-74.0	11.57	126.4	0.034	36.1	0.700	-66.0
250	0.865	-87.5	11.08	117.4	0.037	27.8	0.657	-77.8
300	0.856	-99.2	10.15	109.2	0.038	20.8	0.640	-86.9
350	0.827	-108.7	9.91	102.2	0.039	14.1	0.615	-94.4
400	0.812	-116.8	9.44	95.7	0.040	8.9	0.601	-100.8
450	0.804	-122.6	8.78	90.2	0.040	4.0	0.595	-106.1
500	0.792	-128.2	8.15	84.9	0.040	-0.9	0.595	-110.9
550	0.791	-132.4	7.55	80.5	0.040	-4.6	0.596	-115.2
600	0.790	-136.4	7.00	76.4	0.039	-8.2	0.602	-119.1
650	0.787	-140.2	6.48	72.3	0.038	-11.5	0.608	-122.7
700	0.787	-143.7	6.03	68.5	0.038	-14.5	0.616	-125.9
750	0.788	-147.1	5.59	64.9	0.037	-17.6	0.626	-129.2
800	0.792	-150.0	5.22	61.3	0.036	-20.5	0.634	-132.1
850	0.797	-152.7	4.86	58.0	0.035	-23.1	0.643	-134.9
900	0.801	-155.2	4.54	54.7	0.034	-25.1	0.654	-137.6
950	0.807	-157.3	4.29	51.4	0.033	-27.5	0.664	-140.2
1000	0.812	-159.4	4.06	48.8	0.032	-29.7	0.675	-142.8
1050	0.817	-161.7	3.83	46.1	0.031	-31.6	0.686	-145.3
1100	0.827	-163.5	3.62	43.7	0.030	-33.7	0.695	-147.5
1150	0.834	-165.6	3.42	41.0	0.028	-35.1	0.704	-149.8
1200	0.840	-167.1	3.24	38.6	0.027	-36.6	0.714	-152.0
1250	0.846	-168.4	3.06	36.3	0.026	-38.2	0.723	-154.0
1300	0.845	-170.1	2.89	33.7	0.025	-39.6	0.733	-156.0
1350	0.839	-171.7	2.73	31.2	0.024	-40.9	0.740	-158.1
1400	0.843	-173.8	2.59	28.6	0.023	-41.9	0.749	-160.2
1450	0.847	-175.4	2.47	26.3	0.022	-43.0	0.755	-161.9
1500	0.850	-177.1	2.34	24.0	0.020	-43.9	0.760	-164.0
1550	0.852	-179.0	2.24	21.8	0.019	-44.6	0.768	-166.0
1600	0.858	179.6	2.13	19.7	0.018	-44.7	0.774	-167.8
1650	0.861	178.3	2.05	17.6	0.017	-45.2	0.777	-169.6
1700	0.863	176.8	1.96	15.4	0.016	-45.3	0.784	-171.7
1750	0.863	174.8	1.88	13.1	0.015	-44.9	0.792	-173.6
1800	0.873	173.0	1.81	10.9	0.014	-44.9	0.798	-175.3
1850	0.878	171.4	1.75	9.0	0.013	-43.7	0.800	-177.3
1900	0.886	170.2	1.68	7.3	0.012	-42.9	0.807	-179.3
1950	0.895	168.9	1.61	5.5	0.012	-41.0	0.816	179.1
2000	0.894	168.2	1.55	4.2	0.011	-38.6	0.818	177.6
2050	0.895	167.3	1.48	2.7	0.010	-35.6	0.822	175.6
2100	0.890	165.8	1.42	0.9	0.010	-33.6	0.830	173.8
2150	0.890	164.0	1.37	-1.1	0.009	-29.1	0.837	172.3
2200	0.896	162.6	1.32	-3.1	0.009	-24.1	0.838	170.7
2250	0.898	161.1	1.27	-5.2	0.008	-19.0	0.842	168.9
2300	0.902	159.8	1.22	-7.1	0.008	-12.8	0.848	167.1
2350	0.903	158.4	1.19	-9.0	0.008	-8.3	0.851	165.8
2400	0.901	157.4	1.15	-11.0	0.008	-3.0	0.852	164.1
2450	0.895	155.9	1.11	-12.6	0.008	2.0	0.855	162.4
2500	0.894	154.0	1.07	-14.4	0.008	6.9	0.861	160.9

S Parameter

(V_{DS} = 6 V, I_{DQ} = 10 mA, Z_o = 50 Ω)

f (MHz)	S11		S21		S12		S22	
	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)
100	0.973	-34.4	12.25	150.2	0.022	69.9	0.869	-20.3
150	0.931	-49.5	11.13	138.3	0.031	54.5	0.858	-35.1
200	0.913	-63.2	10.12	128.8	0.038	43.4	0.823	-45.4
250	0.896	-74.6	9.10	120.5	0.043	34.8	0.801	-54.6
300	0.892	-85.3	8.08	113.3	0.046	26.8	0.788	-62.5
350	0.878	-93.6	7.27	107.0	0.048	19.3	0.773	-70.0
400	0.870	-101.5	6.56	100.5	0.050	12.6	0.759	-77.0
450	0.861	-108.4	5.95	94.8	0.051	6.6	0.754	-83.0
500	0.853	-114.4	5.40	89.2	0.051	0.9	0.749	-88.6
550	0.853	-119.5	4.91	84.0	0.051	-3.9	0.747	-93.9
600	0.851	-124.3	4.50	79.0	0.050	-8.5	0.750	-98.8
650	0.845	-128.6	4.15	74.4	0.050	-12.8	0.752	-103.3
700	0.844	-132.8	3.79	70.0	0.048	-16.7	0.755	-107.5
750	0.846	-136.7	3.48	65.6	0.047	-20.3	0.761	-111.6
800	0.849	-140.2	3.22	61.6	0.046	-23.9	0.767	-115.4
850	0.853	-143.5	2.99	57.7	0.045	-27.1	0.772	-119.2
900	0.857	-146.4	2.78	53.9	0.043	-29.8	0.778	-122.7
950	0.860	-149.0	2.59	50.1	0.042	-32.9	0.785	-126.1
1000	0.867	-151.5	2.44	47.2	0.041	-35.5	0.792	-129.4
1050	0.870	-154.0	2.30	44.3	0.039	-38.2	0.798	-132.5
1100	0.875	-156.5	2.15	41.4	0.037	-40.8	0.805	-135.5
1150	0.883	-158.7	2.03	38.5	0.036	-43.1	0.811	-138.4
1200	0.888	-161.0	1.92	35.9	0.034	-45.2	0.818	-141.1
1250	0.890	-162.5	1.79	33.4	0.033	-47.4	0.823	-143.7
1300	0.890	-164.5	1.69	30.7	0.031	-49.1	0.830	-146.2
1350	0.886	-166.6	1.59	27.7	0.030	-51.1	0.834	-148.7
1400	0.886	-168.7	1.51	25.2	0.028	-52.6	0.840	-151.2
1450	0.886	-170.8	1.43	22.9	0.027	-54.4	0.843	-153.3
1500	0.889	-172.6	1.36	20.3	0.025	-56.0	0.846	-155.9
1550	0.891	-174.5	1.29	18.1	0.024	-57.4	0.851	-158.2
1600	0.895	-176.1	1.23	15.9	0.022	-58.5	0.855	-160.3
1650	0.898	-177.6	1.18	13.7	0.021	-59.9	0.855	-162.4
1700	0.896	-179.5	1.12	11.4	0.020	-60.8	0.859	-164.7
1750	0.897	178.5	1.08	9.3	0.019	-61.8	0.866	-166.9
1800	0.903	176.4	1.03	7.0	0.017	-62.7	0.869	-168.8
1850	0.911	174.8	0.99	4.9	0.016	-62.8	0.869	-171.0
1900	0.917	173.4	0.95	3.2	0.015	-63.2	0.874	-173.3
1950	0.926	172.0	0.91	1.5	0.014	-63.2	0.881	-175.1
2000	0.928	171.1	0.87	0.2	0.012	-63.1	0.879	-176.8
2050	0.925	170.1	0.83	-1.5	0.011	-61.7	0.883	-179.1
2100	0.918	168.7	0.80	-3.3	0.010	-60.9	0.888	179.0
2150	0.916	166.8	0.76	-5.3	0.009	-59.1	0.894	177.4
2200	0.918	165.3	0.73	-7.4	0.008	-55.0	0.894	175.6
2250	0.922	163.6	0.71	-9.4	0.007	-52.5	0.895	173.6
2300	0.921	162.2	0.68	-11.4	0.007	-46.3	0.900	171.8
2350	0.923	160.6	0.65	-13.3	0.006	-40.6	0.902	170.3
2400	0.920	159.7	0.63	-15.2	0.006	-33.7	0.902	168.5
2450	0.913	158.0	0.61	-16.8	0.005	-24.3	0.902	166.6
2500	0.911	156.0	0.59	-18.6	0.005	-14.3	0.907	164.9

S Parameter

(V_{DS} = 6 V, I_{DQ} = 25 mA, Z_o = 50 Ω)

f (MHz)	S11		S21		S12		S22	
	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)
100	0.959	-37.1	15.64	150.5	0.021	68.6	0.793	-24.9
150	0.921	-53.7	13.98	137.6	0.030	51.0	0.772	-42.1
200	0.900	-68.0	12.68	128.1	0.034	40.6	0.732	-54.4
250	0.880	-80.1	11.49	119.6	0.038	31.7	0.701	-64.6
300	0.875	-90.8	10.21	112.2	0.040	24.1	0.685	-73.2
350	0.857	-99.6	9.32	105.9	0.042	17.3	0.663	-80.8
400	0.844	-107.8	8.53	99.4	0.043	11.5	0.649	-87.5
450	0.836	-114.7	7.76	93.6	0.044	6.1	0.642	-93.1
500	0.827	-120.7	7.12	88.2	0.044	1.3	0.639	-98.3
550	0.824	-125.9	6.56	83.3	0.043	-3.1	0.637	-103.0
600	0.821	-130.4	6.06	78.7	0.043	-7.0	0.641	-107.4
650	0.818	-134.3	5.63	74.4	0.042	-10.7	0.645	-111.3
700	0.813	-138.3	5.20	70.4	0.041	-14.2	0.651	-115.1
750	0.816	-142.1	4.83	66.5	0.040	-17.5	0.659	-118.7
800	0.817	-145.5	4.50	62.6	0.040	-20.5	0.667	-122.0
850	0.820	-148.4	4.19	59.2	0.039	-23.3	0.674	-125.3
900	0.826	-150.9	3.93	55.7	0.037	-25.8	0.684	-128.3
950	0.830	-153.2	3.70	52.4	0.036	-28.5	0.693	-131.4
1000	0.834	-155.8	3.50	49.4	0.035	-30.8	0.703	-134.3
1050	0.841	-158.3	3.31	46.4	0.034	-33.1	0.713	-137.1
1100	0.847	-160.3	3.12	44.0	0.033	-35.4	0.722	-139.6
1150	0.852	-162.3	2.96	41.3	0.031	-37.3	0.730	-142.2
1200	0.856	-164.4	2.80	38.8	0.030	-39.1	0.739	-144.7
1250	0.865	-165.9	2.63	36.5	0.029	-41.0	0.747	-147.0
1300	0.862	-167.5	2.49	33.8	0.028	-42.5	0.756	-149.3
1350	0.860	-169.6	2.35	30.9	0.026	-43.9	0.762	-151.6
1400	0.860	-171.5	2.24	28.5	0.025	-45.5	0.771	-153.8
1450	0.862	-173.2	2.12	26.1	0.024	-46.8	0.777	-155.8
1500	0.863	-175.2	2.02	23.6	0.023	-48.1	0.781	-158.1
1550	0.866	-176.9	1.93	21.6	0.022	-49.2	0.788	-160.3
1600	0.871	-178.4	1.84	19.3	0.020	-49.9	0.793	-162.4
1650	0.875	-179.8	1.76	17.2	0.019	-50.8	0.796	-164.3
1700	0.873	-178.5	1.68	14.8	0.018	-51.4	0.802	-166.5
1750	0.876	-176.5	1.61	12.7	0.017	-51.4	0.810	-168.5
1800	0.883	-174.5	1.56	10.4	0.016	-51.6	0.815	-170.3
1850	0.889	-173.0	1.50	8.5	0.015	-51.7	0.816	-172.5
1900	0.897	-171.7	1.44	6.7	0.014	-50.9	0.823	-174.6
1950	0.905	-170.4	1.38	5.1	0.013	-50.1	0.832	-176.4
2000	0.909	-169.7	1.33	3.6	0.012	-49.2	0.833	-178.0
2050	0.905	-168.7	1.27	2.1	0.011	-47.0	0.837	-179.9
2100	0.899	-167.3	1.21	0.1	0.010	-45.2	0.843	-177.9
2150	0.898	-165.3	1.17	-1.8	0.009	-42.2	0.850	-176.5
2200	0.902	-163.9	1.12	-3.8	0.008	-37.3	0.851	-174.7
2250	0.906	-162.2	1.09	-6.0	0.008	-33.6	0.854	-172.8
2300	0.908	-160.9	1.05	-7.9	0.007	-28.1	0.860	-171.0
2350	0.908	-159.5	1.02	-9.8	0.007	-22.0	0.863	-169.5
2400	0.907	-158.5	0.98	-11.5	0.007	-16.1	0.863	-167.8
2450	0.898	-157.1	0.95	-13.3	0.007	-9.5	0.866	-166.0
2500	0.898	-154.9	0.92	-15.0	0.007	-2.6	0.872	-164.4

S Parameter

(V_{DS} = 6 V, I_{DQ} = 50 mA, Z_o = 50 Ω)

f (MHz)	S11		S21		S12		S22	
	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)
100	0.960	-41.0	19.06	150.1	0.019	63.9	0.702	-28.7
150	0.916	-58.4	16.77	137.1	0.027	48.6	0.688	-48.7
200	0.892	-73.5	15.28	127.1	0.031	38.3	0.646	-62.4
250	0.868	-86.2	14.02	118.4	0.035	30.0	0.613	-73.4
300	0.860	-97.3	12.48	110.8	0.036	22.9	0.602	-82.6
350	0.840	-106.3	11.51	104.4	0.037	16.3	0.582	-90.1
400	0.825	-114.5	10.57	98.0	0.038	11.5	0.571	-96.7
450	0.816	-121.2	9.62	92.7	0.038	6.3	0.567	-102.2
500	0.810	-126.8	8.80	87.6	0.038	2.0	0.567	-107.1
550	0.806	-131.6	8.12	83.0	0.038	-2.0	0.569	-111.4
600	0.802	-135.9	7.49	78.8	0.037	-5.4	0.573	-115.4
650	0.797	-139.6	6.94	74.9	0.037	-8.7	0.578	-119.0
700	0.795	-143.4	6.44	71.2	0.036	-11.8	0.586	-122.3
750	0.797	-146.7	5.97	67.5	0.035	-14.7	0.596	-125.5
800	0.798	-149.7	5.57	64.0	0.035	-17.6	0.604	-128.4
850	0.806	-152.4	5.20	60.7	0.034	-19.9	0.612	-131.3
900	0.807	-155.0	4.89	57.4	0.033	-21.9	0.623	-134.0
950	0.811	-157.3	4.59	54.3	0.032	-24.5	0.632	-136.6
1000	0.817	-159.5	4.35	51.4	0.031	-26.4	0.645	-139.2
1050	0.822	-161.6	4.11	48.7	0.030	-28.4	0.655	-141.7
1100	0.831	-163.6	3.90	46.3	0.029	-30.5	0.666	-144.0
1150	0.834	-165.7	3.69	43.7	0.028	-32.1	0.674	-146.3
1200	0.842	-167.2	3.50	41.3	0.027	-33.4	0.685	-148.5
1250	0.846	-168.7	3.30	39.0	0.026	-35.1	0.695	-150.5
1300	0.848	-170.2	3.13	36.4	0.025	-36.5	0.703	-152.6
1350	0.842	-171.9	2.97	33.7	0.024	-37.5	0.711	-154.7
1400	0.843	-173.9	2.82	31.4	0.023	-38.5	0.721	-156.7
1450	0.844	-175.6	2.69	29.0	0.022	-40.1	0.727	-158.5
1500	0.849	-177.3	2.56	26.7	0.021	-40.5	0.733	-160.7
1550	0.849	-178.8	2.45	24.5	0.020	-41.3	0.740	-162.7
1600	0.857	-179.6	2.33	22.4	0.018	-41.5	0.748	-164.6
1650	0.860	-178.2	2.24	20.1	0.017	-42.1	0.752	-166.3
1700	0.860	-176.8	2.15	17.9	0.017	-42.2	0.758	-168.4
1750	0.861	-174.8	2.06	15.9	0.016	-42.1	0.767	-170.3
1800	0.870	-172.9	1.99	13.6	0.015	-41.9	0.774	-172.1
1850	0.878	-171.4	1.92	11.5	0.014	-40.8	0.776	-174.0
1900	0.884	-170.1	1.84	9.8	0.013	-39.7	0.784	-176.1
1950	0.889	-169.0	1.77	8.3	0.012	-38.1	0.793	-177.7
2000	0.895	-168.3	1.71	6.7	0.011	-36.3	0.796	-179.3
2050	0.890	-167.5	1.63	5.3	0.011	-33.9	0.799	-178.7
2100	0.886	-165.9	1.57	3.3	0.010	-31.3	0.808	-176.8
2150	0.887	-164.1	1.51	1.3	0.009	-27.8	0.816	-175.3
2200	0.891	-162.6	1.46	-0.7	0.009	-23.0	0.818	-173.6
2250	0.895	-161.2	1.40	-2.7	0.009	-19.0	0.822	-171.8
2300	0.897	-159.7	1.36	-4.8	0.008	-14.5	0.828	-170.1
2350	0.898	-158.5	1.31	-6.6	0.008	-9.8	0.833	-168.6
2400	0.896	-157.4	1.27	-8.5	0.008	-5.1	0.835	-167.0
2450	0.890	-155.8	1.23	-10.4	0.008	-0.3	0.836	-165.2
2500	0.890	-154.0	1.19	-12.1	0.008	5.2	0.843	-163.6

S Parameter

 $(V_{DS} = 6\text{ V}, I_{DQ} = 100\text{ mA}, Z_o = 50\ \Omega)$

f (MHz)	S11		S21		S12		S22	
	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)
100	0.972	-45.9	22.91	149.6	0.019	65.4	0.615	-34.3
150	0.920	-64.3	19.70	136.4	0.024	48.3	0.597	-55.7
200	0.888	-80.4	17.99	125.8	0.028	37.6	0.560	-70.8
250	0.860	-93.9	16.78	116.9	0.031	29.8	0.534	-82.5
300	0.847	-104.9	14.91	109.3	0.032	23.1	0.517	-91.7
350	0.827	-113.3	13.65	103.1	0.033	16.8	0.517	-99.6
400	0.816	-120.8	12.39	97.3	0.033	11.9	0.511	-106.1
450	0.809	-126.9	11.24	92.4	0.033	7.4	0.512	-111.3
500	0.799	-132.3	10.23	87.7	0.033	3.3	0.513	-115.9
550	0.800	-136.7	9.38	83.4	0.033	-0.3	0.518	-120.0
600	0.801	-140.6	8.68	79.5	0.033	-3.5	0.524	-123.5
650	0.792	-144.0	8.00	75.9	0.032	-6.6	0.531	-126.7
700	0.788	-147.5	7.41	72.3	0.032	-9.3	0.540	-129.7
750	0.790	-150.6	6.89	68.9	0.031	-11.7	0.550	-132.5
800	0.793	-153.5	6.42	65.6	0.031	-14.3	0.558	-135.0
850	0.798	-156.1	5.99	62.3	0.030	-16.5	0.567	-137.5
900	0.801	-158.5	5.62	59.1	0.029	-18.3	0.578	-139.8
950	0.805	-160.5	5.31	56.1	0.028	-20.2	0.588	-142.2
1000	0.809	-162.7	5.03	53.5	0.027	-21.9	0.601	-144.5
1050	0.814	-164.5	4.77	51.1	0.027	-23.6	0.612	-146.5
1100	0.823	-166.3	4.51	48.5	0.026	-25.4	0.622	-148.5
1150	0.829	-168.2	4.29	45.9	0.025	-26.6	0.632	-150.6
1200	0.835	-169.7	4.08	43.7	0.024	-27.9	0.643	-152.6
1250	0.837	-171.0	3.85	41.5	0.023	-28.9	0.653	-154.3
1300	0.836	-172.5	3.65	39.0	0.022	-30.3	0.662	-156.1
1350	0.834	-174.2	3.47	36.4	0.021	-30.8	0.670	-158.1
1400	0.835	-176.1	3.31	33.9	0.021	-31.5	0.681	-159.9
1450	0.837	-177.8	3.15	31.6	0.020	-32.5	0.688	-161.4
1500	0.839	-179.4	3.00	29.4	0.019	-33.0	0.694	-163.4
1550	0.844	179.0	2.88	27.2	0.018	-33.2	0.702	-165.3
1600	0.849	177.7	2.75	25.1	0.017	-32.9	0.711	-167.0
1650	0.850	176.5	2.64	23.1	0.016	-32.8	0.715	-168.7
1700	0.850	174.9	2.53	20.8	0.015	-32.6	0.722	-170.6
1750	0.854	173.0	2.44	18.5	0.015	-31.9	0.731	-172.5
1800	0.861	171.4	2.36	16.4	0.014	-31.0	0.738	-174.1
1850	0.868	170.0	2.27	14.4	0.013	-29.7	0.741	-175.9
1900	0.875	168.7	2.19	12.6	0.012	-28.0	0.749	-177.9
1950	0.881	167.5	2.11	11.0	0.012	-26.0	0.759	-179.4
2000	0.886	166.8	2.03	9.6	0.011	-24.3	0.763	179.0
2050	0.882	166.0	1.95	8.0	0.011	-21.0	0.768	177.1
2100	0.878	164.6	1.87	6.2	0.010	-18.4	0.776	175.3
2150	0.877	163.1	1.80	4.2	0.010	-15.2	0.785	174.0
2200	0.883	161.5	1.74	2.2	0.010	-10.2	0.787	172.3
2250	0.891	159.9	1.68	0.1	0.009	-6.5	0.792	170.6
2300	0.892	158.6	1.63	-1.9	0.010	-2.2	0.799	168.9
2350	0.896	157.7	1.58	-3.8	0.009	1.0	0.804	167.5
2400	0.892	156.4	1.53	-5.7	0.009	4.1	0.806	166.0
2450	0.885	155.1	1.47	-7.5	0.010	7.7	0.810	164.3
2500	0.884	153.0	1.43	-9.4	0.010	11.4	0.816	162.7

S Parameter

(V_{DS} = 7.2 V, I_{DQ} = 50 mA, Z_o = 50 Ω)

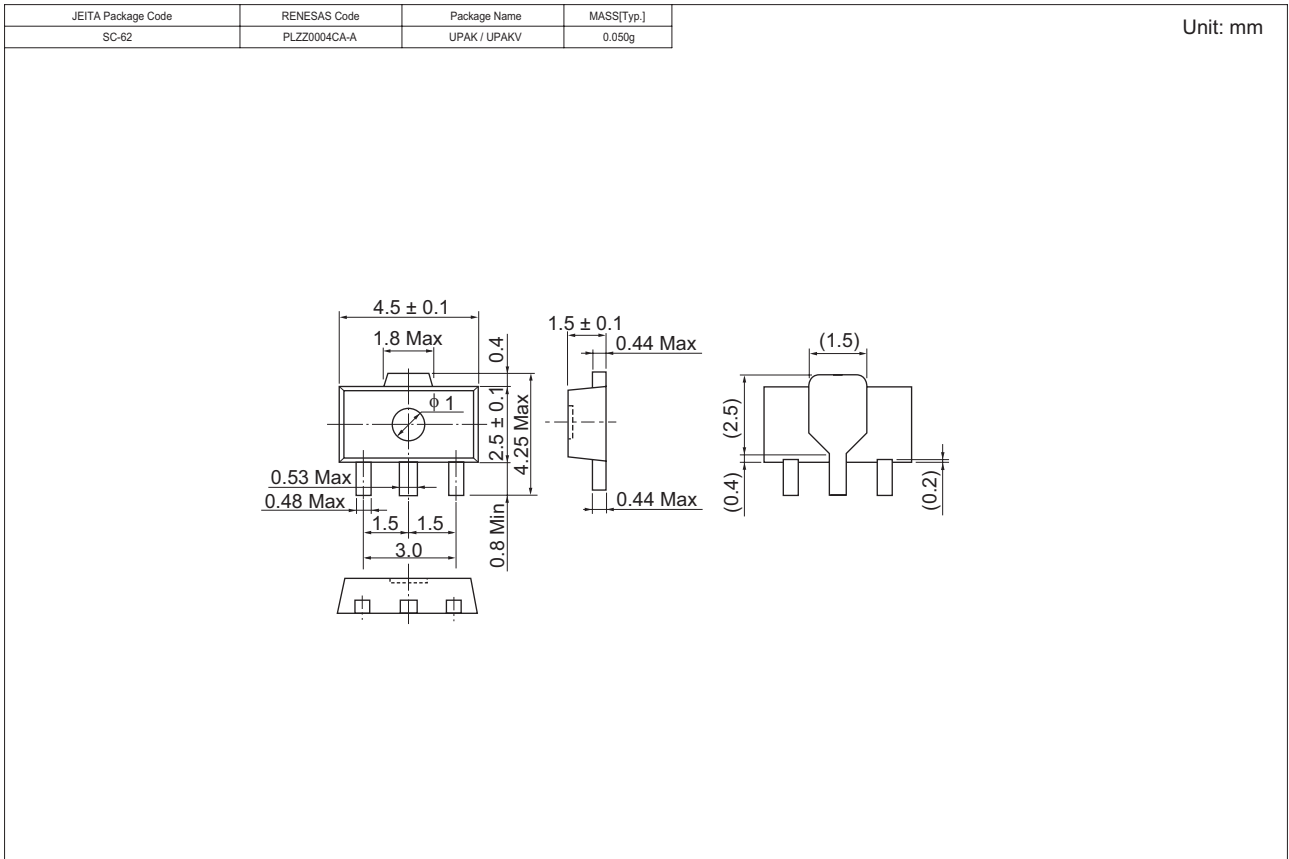
f (MHz)	S11		S21		S12		S22	
	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)
100	0.978	-39.6	19.82	151.1	0.017	73.5	0.701	-27.0
150	0.927	-56.8	17.53	138.2	0.024	50.7	0.654	-46.3
200	0.899	-71.6	15.97	128.4	0.029	39.5	0.619	-59.5
250	0.877	-84.2	14.52	120.0	0.032	31.8	0.591	-70.5
300	0.869	-95.5	12.92	112.1	0.033	24.7	0.569	-79.3
350	0.850	-104.7	11.88	105.7	0.034	18.1	0.565	-87.1
400	0.834	-112.9	10.89	99.4	0.035	13.0	0.554	-93.7
450	0.828	-119.5	9.93	94.0	0.035	8.3	0.551	-99.2
500	0.815	-125.4	9.13	88.7	0.036	3.8	0.551	-104.1
550	0.816	-130.4	8.40	84.3	0.035	-0.2	0.553	-108.6
600	0.812	-134.5	7.77	80.1	0.035	-3.7	0.558	-112.6
650	0.807	-138.5	7.21	76.2	0.034	-7.1	0.564	-116.1
700	0.805	-142.2	6.69	72.5	0.034	-10.0	0.571	-119.6
750	0.807	-145.8	6.21	69.0	0.033	-13.0	0.581	-122.9
800	0.808	-149.0	5.79	65.3	0.033	-15.8	0.591	-125.8
850	0.814	-151.7	5.41	62.0	0.032	-18.2	0.599	-128.7
900	0.816	-154.2	5.07	58.7	0.031	-20.1	0.609	-131.5
950	0.820	-156.5	4.79	55.5	0.030	-22.6	0.619	-134.2
1000	0.823	-158.8	4.54	52.7	0.029	-24.6	0.631	-136.8
1050	0.829	-161.1	4.30	50.0	0.028	-26.4	0.642	-139.3
1100	0.837	-163.0	4.07	47.5	0.027	-28.5	0.653	-141.6
1150	0.843	-164.8	3.86	44.8	0.026	-29.9	0.661	-144.0
1200	0.848	-166.7	3.66	42.5	0.025	-31.4	0.672	-146.3
1250	0.850	-168.3	3.45	40.0	0.024	-32.9	0.682	-148.3
1300	0.851	-169.6	3.27	37.7	0.023	-34.0	0.691	-150.4
1350	0.848	-171.6	3.11	34.9	0.022	-35.0	0.700	-152.5
1400	0.849	-173.5	2.96	32.5	0.021	-36.0	0.710	-154.6
1450	0.851	-175.3	2.82	30.1	0.020	-37.1	0.717	-156.4
1500	0.854	-176.9	2.69	28.1	0.019	-37.7	0.722	-158.6
1550	0.857	-178.7	2.57	25.5	0.018	-38.4	0.731	-160.7
1600	0.861	-179.9	2.45	23.6	0.017	-38.4	0.738	-162.5
1650	0.864	-178.7	2.35	21.4	0.016	-38.5	0.742	-164.3
1700	0.865	-177.1	2.26	19.1	0.015	-38.3	0.749	-166.5
1750	0.865	-175.2	2.17	16.9	0.014	-37.9	0.757	-168.4
1800	0.874	-173.3	2.09	14.5	0.013	-37.6	0.764	-170.2
1850	0.880	-171.7	2.02	12.6	0.013	-36.4	0.767	-172.2
1900	0.888	-170.5	1.94	10.8	0.012	-34.9	0.775	-174.3
1950	0.895	-169.3	1.87	9.1	0.011	-32.4	0.785	-176.0
2000	0.898	-168.4	1.79	7.8	0.010	-30.7	0.786	-177.5
2050	0.893	-167.4	1.72	6.1	0.010	-26.5	0.791	-179.6
2100	0.891	-166.1	1.65	4.3	0.009	-24.2	0.799	178.6
2150	0.891	-164.5	1.59	2.3	0.009	-19.9	0.808	177.1
2200	0.896	-162.8	1.53	0.3	0.009	-14.9	0.809	175.3
2250	0.901	-161.4	1.48	-1.7	0.008	-10.2	0.813	173.5
2300	0.902	-160.0	1.43	-3.9	0.008	-5.4	0.821	171.8
2350	0.903	-158.8	1.39	-5.7	0.008	-0.3	0.824	170.4
2400	0.901	-157.6	1.35	-7.6	0.008	4.0	0.826	168.7
2450	0.894	-156.2	1.30	-9.4	0.009	8.7	0.830	166.8
2500	0.895	-154.2	1.26	-11.3	0.009	12.7	0.835	165.3

S Parameter

(V_{DS} = 7.5 V, I_{DQ} = 50 mA, Z_o = 50 Ω)

f (MHz)	S11		S21		S12		S22	
	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)	MAG	ANG (deg.)
100	0.986	-38.8	20.01	150.8	0.016	71.9	0.689	-26.5
150	0.929	-56.2	17.57	138.8	0.023	51.6	0.647	-46.0
200	0.901	-71.3	16.07	128.8	0.028	40.1	0.612	-59.1
250	0.879	-84.0	14.61	120.1	0.031	31.9	0.585	-69.9
300	0.872	-95.1	13.00	112.6	0.032	25.2	0.564	-78.7
350	0.851	-104.4	11.95	106.0	0.034	19.0	0.560	-86.6
400	0.838	-112.5	10.97	99.7	0.035	13.5	0.550	-93.1
450	0.831	-119.1	10.01	94.3	0.035	8.7	0.547	-98.7
500	0.821	-125.2	9.19	89.3	0.035	4.2	0.547	-103.5
550	0.817	-130.0	8.47	84.7	0.035	0.3	0.549	-108.0
600	0.817	-134.4	7.84	80.4	0.034	-3.3	0.554	-112.0
650	0.807	-138.3	7.27	76.4	0.034	-6.7	0.560	-115.7
700	0.808	-142.2	6.74	72.9	0.033	-9.5	0.568	-119.0
750	0.807	-145.7	6.25	69.1	0.033	-12.4	0.577	-122.3
800	0.809	-148.8	5.85	65.6	0.032	-15.3	0.587	-125.3
850	0.816	-151.6	5.46	62.3	0.031	-17.8	0.596	-128.2
900	0.820	-154.3	5.14	59.1	0.030	-19.5	0.605	-131.0
950	0.820	-156.5	4.84	55.8	0.029	-22.1	0.615	-133.7
1000	0.826	-158.6	4.58	53.1	0.029	-24.0	0.628	-136.3
1050	0.832	-161.0	4.34	50.3	0.028	-26.0	0.639	-138.9
1100	0.835	-162.8	4.11	47.8	0.027	-27.9	0.649	-141.2
1150	0.842	-165.0	3.90	45.3	0.026	-29.5	0.658	-143.5
1200	0.850	-166.6	3.70	42.9	0.025	-30.9	0.669	-145.8
1250	0.854	-167.9	3.50	40.6	0.024	-32.1	0.679	-147.8
1300	0.853	-169.6	3.31	37.9	0.023	-33.4	0.688	-149.9
1350	0.848	-171.4	3.14	35.3	0.022	-34.3	0.696	-152.0
1400	0.850	-173.4	3.00	32.8	0.021	-35.3	0.707	-154.2
1450	0.851	-175.2	2.85	30.6	0.020	-36.1	0.713	-155.9
1500	0.853	-176.7	2.72	28.1	0.019	-36.8	0.719	-158.1
1550	0.857	-178.3	2.60	25.9	0.018	-37.3	0.727	-160.2
1600	0.862	-179.9	2.48	23.6	0.017	-37.2	0.735	-162.1
1650	0.866	-178.8	2.38	21.7	0.016	-37.3	0.739	-163.9
1700	0.865	-177.1	2.28	19.3	0.015	-37.7	0.745	-166.0
1750	0.869	-175.1	2.20	17.0	0.014	-36.7	0.754	-168.0
1800	0.874	-173.4	2.12	14.9	0.013	-36.4	0.761	-169.7
1850	0.882	-171.9	2.05	12.9	0.012	-34.5	0.765	-171.8
1900	0.889	-170.6	1.97	11.1	0.012	-33.5	0.772	-173.9
1950	0.895	-169.4	1.89	9.5	0.011	-31.0	0.782	-175.5
2000	0.897	-168.5	1.82	8.0	0.010	-29.2	0.784	-177.2
2050	0.896	-167.7	1.74	6.4	0.010	-25.2	0.789	-179.2
2100	0.892	-166.1	1.67	4.7	0.009	-22.6	0.797	-179.0
2150	0.892	-164.4	1.61	2.5	0.009	-18.1	0.805	-177.5
2200	0.897	-162.9	1.56	0.4	0.009	-12.7	0.807	-175.8
2250	0.899	-161.6	1.50	-1.6	0.008	-8.6	0.811	-173.9
2300	0.902	-160.0	1.46	-3.8	0.008	-2.5	0.819	-172.1
2350	0.905	-158.7	1.41	-5.7	0.008	2.0	0.822	-170.8
2400	0.901	-157.7	1.37	-7.3	0.008	6.0	0.824	-169.0
2450	0.896	-156.0	1.32	-9.2	0.009	10.1	0.828	-167.2
2500	0.895	-154.3	1.27	-10.9	0.009	14.5	0.834	-165.6

Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
RQA0004LXTL-E	1000 pcs	φ178 mm reel, 12 mm emboss taping

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

Notes:

1. This document is provided for reference purposes only so that Renesas customers may select the appropriate Renesas products for their use. Renesas neither makes warranties or representations with respect to the accuracy or completeness of the information contained in this document nor grants any license to any intellectual property rights or any other rights of Renesas or any third party with respect to the information in this document.
2. Renesas shall have no liability for damages or infringement of any intellectual property or other rights arising out of the use of any information in this document, including, but not limited to, product data, diagrams, charts, programs, algorithms, and application circuit examples.
3. You should not use the products or the technology described in this document for the purpose of military applications such as the development of weapons of mass destruction or for the purpose of any other military use. When exporting the products or technology described herein, you should follow the applicable export control laws and regulations, and procedures required by such laws and regulations.
4. All information included in this document such as product data, diagrams, charts, programs, algorithms, and application circuit examples, is current as of the date this document is issued. Such information, however, is subject to change without any prior notice. Before purchasing or using any Renesas products listed in this document, please confirm the latest product information with a Renesas sales office. Also, please pay regular and careful attention to additional and different information to be disclosed by Renesas such as that disclosed through our website. (<http://www.renesas.com>)
5. Renesas has used reasonable care in compiling the information included in this document, but Renesas assumes no liability whatsoever for any damages incurred as a result of errors or omissions in the information included in this document.
6. When using or otherwise relying on the information in this document, you should evaluate the information in light of the total system before deciding about the applicability of such information to the intended application. Renesas makes no representations, warranties or guarantees regarding the suitability of its products for any particular application and specifically disclaims any liability arising out of the application and use of the information in this document or Renesas products.
7. With the exception of products specified by Renesas as suitable for automobile applications, Renesas products are not designed, manufactured or tested for applications or otherwise in systems the failure or malfunction of which may cause a direct threat to human life or create a risk of human injury or which require especially high quality and reliability such as safety systems, or equipment or systems for transportation and traffic, healthcare, combustion control, aerospace and aeronautics, nuclear power, or undersea communication transmission. If you are considering the use of our products for such purposes, please contact a Renesas sales office beforehand. Renesas shall have no liability for damages arising out of the uses set forth above.
8. Notwithstanding the preceding paragraph, you should not use Renesas products for the purposes listed below:
 - (1) artificial life support devices or systems
 - (2) surgical implantations
 - (3) healthcare intervention (e.g., excision, administration of medication, etc.)
 - (4) any other purposes that pose a direct threat to human lifeRenesas shall have no liability for damages arising out of the uses set forth in the above and purchasers who elect to use Renesas products in any of the foregoing applications shall indemnify and hold harmless Renesas Technology Corp., its affiliated companies and their officers, directors, and employees against any and all damages arising out of such applications.
9. You should use the products described herein within the range specified by Renesas, especially with respect to the maximum rating, operating supply voltage range, movement power voltage range, heat radiation characteristics, installation and other product characteristics. Renesas shall have no liability for malfunctions or damages arising out of the use of Renesas products beyond such specified ranges.
10. Although Renesas endeavors to improve the quality and reliability of its products, IC products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Please be sure to implement safety measures to guard against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a Renesas product, such as safety design for hardware and software including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other applicable measures. Among others, since the evaluation of microcomputer software alone is very difficult, please evaluate the safety of the final products or system manufactured by you.
11. In case Renesas products listed in this document are detached from the products to which the Renesas products are attached or affixed, the risk of accident such as swallowing by infants and small children is very high. You should implement safety measures so that Renesas products may not be easily detached from your products. Renesas shall have no liability for damages arising out of such detachment.
12. This document may not be reproduced or duplicated, in any form, in whole or in part, without prior written approval from Renesas.
13. Please contact a Renesas sales office if you have any questions regarding the information contained in this document, Renesas semiconductor products, or if you have any other inquiries.



RENESAS SALES OFFICES

<http://www.renesas.com>

Refer to "<http://www.renesas.com/en/network>" for the latest and detailed information.

Renesas Technology America, Inc.
450 Holger Way, San Jose, CA 95134-1368, U.S.A
Tel: <1> (408) 382-7500, Fax: <1> (408) 382-7501

Renesas Technology Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.
Tel: <44> (1628) 585-100, Fax: <44> (1628) 585-900

Renesas Technology (Shanghai) Co., Ltd.
Unit 204, 205, AZIA Center, No.1233 Lujiazui Ring Rd, Pudong District, Shanghai, China 200120
Tel: <86> (21) 5877-1818, Fax: <86> (21) 6887-7898

Renesas Technology Hong Kong Ltd.
7th Floor, North Tower, World Finance Centre, Harbour City, 1 Canton Road, Tsimshatsui, Kowloon, Hong Kong
Tel: <852> 2265-6688, Fax: <852> 2730-6071

Renesas Technology Taiwan Co., Ltd.
10th Floor, No.99, Fushing North Road, Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

Renesas Technology Singapore Pte. Ltd.
1 Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632
Tel: <65> 6213-0200, Fax: <65> 6278-8001

Renesas Technology Korea Co., Ltd.
Kukje Center Bldg. 18th Fl., 191, 2-ka, Hangang-ro, Yongsan-ku, Seoul 140-702, Korea
Tel: <82> (2) 796-3115, Fax: <82> (2) 796-2145

Renesas Technology Malaysia Sdn. Bhd
Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No.18, Jalan Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: <603> 7955-9390, Fax: <603> 7955-9510